CS 101: Practice Questions for Test 1, SOLUTIONS

1. Write a Java application which prompts the user to enter 15 integers, then computes the sum, and then prints the sum to the screen.

   import java.util.Scanner;
   public class SumInts{
       public static void main (String[] args){
           Scanner scan = new Scanner(System.in);
           int sum=0;
           System.out.print("Enter 15 integers: ");
           for (int i=1; i<=15; i++)
               sum += scan.nextInt();
           System.out.println("The sum is " + sum);
       }
   }

2. Recall the Pythagorean Theorem says that if \(a, b\) are the lengths of two edges of a right triangle, then the length of the hypotenuse \(c\) is given by
   \[
   c^2 = a^2 + b^2.
   \]
   Write a Java application which prompts the user to enter the lengths of two edges of a right triangle and then computes the length of the hypotenuse.
   Solution:

   import java.util.Scanner;
   public class Hypotenuse{
       public static void main(String[] args){
           Scanner scan = new Scanner(System.in);
           double a,b,c;
           System.out.print("Enter the lengths of two sides: ");
           a = scan.nextDouble();
           b = scan.nextDouble();
           c = Math.sqrt(a*a + b*b);
           System.out.println("The hypotenuse has length " + c);
       }
   }
3. What is the output of the following code fragment?

```java
int x = 1;
while (x<5){
    System.out.println(x);
    if (x==3)
        x++;
    else
        x = x+2;
}
```

Solution:

1
3
4

4. What is the output of the following code fragment?

```java
for (int j=1; j<=5; j++){
    for (int i=1; i<=4; i++)
        System.out.print("x");
    System.out.println();
}
```

Solution:

```
xxxx
xxxx
xxxx
xxxx
xxxx
```

5. Which of the following are valid Java identifiers?

XBox
$3t4
hop-toad
if
2ndFloor
MyGoodness
Solution: XBox, $3t4$, and MyGoodness are valid Java identifiers. hop-toad is not, since the - character is not valid (it is treated as a minus sign). if is not valid, since it is a Java reserved word. 2ndFloor is not valid since it begins with a digit.

6. What is the output?

```java
public class EnumerateSeasons{
    enum Season{Spring,Summer,Fall,Winter}
    public static void main(String[] args){
        Season s = Season.Spring, t = Season.Winter;
        System.out.println(s.name());
        System.out.println(t.ordinal());
    }
}
```

Solution:

```
Spring
3
```

7. The Java compiler produces

(a) Java bytecode
(b) machine language
(c) assembly language
(d) an iterated list
(e) an html file

Solution: (a)

8. A byte is

(a) 256 bits
(b) 4 bits
(c) 8 bits
(d) approximately 1000000 bits
9. The Java expression
\[ \frac{5}{2} + 3 \]
evaluates to
(a) 1
(b) 5
(c) 5.5
(d) 0
(e) none of the above

Solution: (b). Evaluate using integer division \( \frac{5}{2} + 3 \) is \( 2 + 3 \) is 5.

10. Which are the following is part of the hardware of a computer system?
(a) operating system
(b) compiler
(c) interpreter
(d) bus
(e) bytecode

Solution: (d)

11. Write a Java expression which represents the floating-point constant two thirds.

Solution: \( \frac{2}{3} \) or \((\text{double})\frac{2}{3}\) or \(\frac{2.0}{3.0} \)

12. If \( x \) and \( y \) are Java variables of type double, write the Java code for the mathematical expression

\[ \frac{x^2 + 2}{3y - 5} \]

Solution: \( \text{Math.pow}(x, 2) + 2 \) / \((3*y - 5) \)
13. Write a Java application which rolls two standard dice (generates two random integers from 1 to 6), and prints out their sum.

Solution:

```java
public class TwoDice{
    public static void main (String[] args){
        int die1,die2,sum;
        die1 = (int)(Math.random()*6) + 1;
        die2 = (int)(Math.random()*6) + 1;
        sum = die1 + die2;
        System.out.println("The sum of the two dice is " + sum);
    }
}
```

14. For each of the following pairs, which represents a class and which represents an object of that class?

(a) Celebrity, Britney Spears
   Solution: class: Celebrity, object: Britney Spears

(b) Mickey Mouse, Rodent
   Solution: class: Rodent, object: Mickey Mouse

(c) Author, William Shakespeare
   Solution: class: Author, object: William Shakespeare

(d) Sport, Baseball
   Solution: class: Sport, object: Baseball

15. Assume \( n \) is a Java variable of type int. Write a code fragment to print to the screen positive if \( n \) is positive, zero if \( n \) is zero, and negative if \( n \) is negative.

Solution:

```java
if (n>0)
    System.out.println("positive");
else if (n==0)
    System.out.println("zero");
else
    System.out.println("negative");
```
16. Compute the Java expression $15 \div 6 + 9$.

Solution: $15 \div 6 + 9$ is $3 + 9$ is 12.